



TENNESSEE DEPARTMENT OF

**EDUCATION**  
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## Landscaping and Turf Science

<b>Primary Career Cluster:</b>	Agriculture, Food and Natural Resources
<b>Consultant:</b>	Steven Gass, (615) 532-2847, <a href="mailto:Steven.Gass@tn.gov">Steven.Gass@tn.gov</a>
<b>Course Code(s):</b>	5951
<b>Prerequisite(s):</b>	Agriscience (5957) and Principles of Plant Science and Hydroculture (TBD)
<b>Credit:</b>	1
<b>Grade Level:</b>	12
<b>Graduation Requirements:</b>	This course satisfies one of three credits required for an elective focus when taken in conjunction with other Agriculture courses.
<b>Programs of Study and Sequence:</b>	This is the fourth and final course in the <i>Horticulture Science</i> program of study.
<b>Necessary Equipment:</b>	Refer to the Teacher Resources page below.
<b>Aligned Student Organization(s):</b>	FFA: <a href="http://www.tnffa.org">http://www.tnffa.org</a> Allie Ellis, (615) 253-5207, <a href="mailto:Allie.Ellis@tn.gov">Allie.Ellis@tn.gov</a>
<b>Supervised Agricultural Experience and/or Coordinating Work-Based Learning:</b>	All Agriculture students are encouraged to participate in a Supervised Agricultural Experience (SAE) program. In addition, if a teacher has completed work-based learning training, he or she can offer appropriate placement. For more information, please visit <a href="http://www.tn.gov/education/cte/wb/">http://www.tn.gov/education/cte/wb/</a> .
<b>Available Student Industry Certifications:</b>	<ul style="list-style-type: none"><li>• Worker Protection Standard (WPS) for Agricultural Pesticides</li><li>• Tennessee Certified Nursery Professional Certification (Note: Must be 18 years old for this credential)</li></ul>
<b>Dual Credit or Dual Enrollment Opportunities:</b>	There are no statewide dual credit/dual enrollment opportunities for this course. If interested in establishing a local opportunity, reach out to your local postsecondary institution.
<b>Teacher Endorsement(s):</b>	048, 448
<b>Required Teacher Certifications/Training:</b>	None
<b>Teacher Resources:</b>	<a href="http://www.tn.gov/education/cte/AgricultureFoodNaturalResources.shtml">http://www.tn.gov/education/cte/AgricultureFoodNaturalResources.shtml</a>

### Course Description

*Landscaping and Turf Science* is a applied-knowledge course designed to provide challenging academic standards and relevant technical knowledge and skills needed for further education and careers in landscape design, maintenance, and turf management. Content includes site analysis and planning, principles of design, and plant selection and care techniques. Standards in this course are aligned with Tennessee Common Core State Standards for English Language Arts & Literacy in Technical Subjects,

Tennessee Common Core State Standards for Mathematics, and Tennessee state standards for Biology II, as well as National Agriculture, Food and Natural Resources Career Cluster Content Standards.\*

## Program of Study Application

This is the fourth and final course in the *Horticulture Sciences* program of study. For more information on the benefits and requirements of implementing this program in full, please visit the Agriculture, Food, and Natural Resources website at

<http://www.tn.gov/education/cte/AgricultureFoodNaturalResources.shtml>.

## Course Standards

### Introduction to Landscaping and Turf Management

- 1) Gather and analyze labor data from sources such as the United States Bureau of Labor Statistics and the Tennessee Department of Labor to predict the employment outlook in landscaping and turf management careers. Summarize the interpersonal, business, and technical skills needed for a career in landscaping or turf management. Develop a resume for a selected occupation that includes documented development of industry-related skills (i.e., work experience, SAE records, and proficiency applications). (TN CCSS Reading 2; TN CCSS Writing 4, 9)
- 2) Explain general occupational and horticulture industry safety standards. Identify commonly used machinery and equipment and develop a checklist of associated safety and maintenance procedures. Assess the purpose of worker protection standards, complete required safety tests with 100 percent accuracy, and obtain the worker protection standards student industry certification. (TN CCSS Reading 3)

### Tree and Shrub Selection and Maintenance

- 3) Develop illustrative models that identify the basic parts of trees and shrubs. Demonstrate the ability to visually identify and distinguish between common tree and shrub species used for landscaping and describe research-based practices in harvesting, transportation, transplanting, and care. (TN CCSS Reading 7; TN CCSS Writing 4, 8; TN Biology II 7)
- 4) Using descriptive text, summarize methods for general care and maintenance of trees and shrubs, including planting, pruning, mulching, and fertilizing techniques. Drawing on research and technical data, justify the importance of site evaluation, preparation, and consideration of hardiness zones in the selection of trees and shrubs. (TN CCSS Reading 2, 3; TN CCSS Writing 2)

### Plant Selection and Maintenance

- 5) Visually identify and distinguish among common ground cover, vines, and plants used for landscaping. Differentiate function, form, and growth requirements for common perennials, annuals, and biennials.
- 6) Assess methods for general care and maintenance of ground cover, vines, and plants, including planting, pruning, mulching, and fertilizing techniques. Recommend specific vines and ground



covers to solve special landscaping issues, and justify recommendations in an argumentative text citing textual and technical evidence. (TN CCSS Reading 2; TN CCSS Writing 1)

### **Turf Grass Selection and Maintenance**

- 7) Cite specific textual evidence to compare and contrast the functions and components of turf grasses of common turf grass species. Demonstrate the ability to visually identify and distinguish between turf grass species and cultivars and compose an argument justifying their applications for specific uses. (TN CCSS Reading 1; TN CCSS Writing 1, 9)
- 8) Describe methods for the establishment and maintenance of turf grasses, including soil preparation, installation, water, nutrient and pH needs, and fertilizing techniques, attending to appropriate ratios and calculations. Draw conclusions about the importance of site selection, site preparation, and consideration of hardiness zones in the selection of turf grass species and cultivars. (TN CCSS Reading 3, 9)
- 9) Evaluate and compare special management needs of residential, commercial, and sports turf. Identify management practices and associated equipment requirements for mowing, irrigation and weed, disease, and fungus control for common turf grass species. (TN CCSS Reading 1, 3; TN CCSS Math N-Q)

### **Commercial Interior Landscaping**

- 10) Identify and classify basic ornamental flowers and plants (i.e. potted, cut) used for the commercial interior landscape, and summarize their propagation, installation techniques, and maintenance requirements, citing applicable technical texts. Drawing on knowledge acquired in previous courses, demonstrate in a live or presentation format the ability to construct an interior display using a variety of plant materials, including but not limited to foliage, flowering plants (both cut and potted), live, and permanent/silk plants. (TN CCSS Reading 2; TN Biology II 7)
- 11) Identify and recommend effective management practices for the interior environment, including light, humidity, growing media, and disease and pest control. Compare and contrast decorative accessory items (containers, planters, water features, permanent/silk plants, live plants) in the interior landscape. (TN CCSS Reading 9)

### **Pest Management**

- 12) Identify and compare the common landscape and turf grass pests and their respective prevention and control methods. Categorize the basic types of pesticides and describe their application methods, including but not limited to rate, environmental conditions, and reentry times. Using quantitative reasoning and appropriate units, calculate proper formulations of pesticides based upon label directions by creating systems of equations that describe numerical relationships. (TN CCSS Reading 3; TN CCSS Math N-Q, A-CED)
- 13) Demonstrate in a live setting or in a presentation the ability to properly mix and apply pesticides precisely, attending to important safety standards, selection, handling, application, storage, and disposal. (TN CCSS Reading 3; TN CCSS Math N-Q)



## **Water Management**

- 14) Develop a written resource describing the seven principles of xeriscaping and indications for use in landscapes, citing specific textual evidence. (TN CCSS Reading 2; TN CCSS Writing 4, 8; TN CCSS Math N-Q)
- 15) Examine the various types of water gardens and pools and their applications for landscape enhancement. Develop a customer information packet outlining best management practices to maintain a healthy water garden and pool, addressing at minimum the following considerations: pH, nitrate, dissolved oxygen, algae, pollutants, filter requirements, and feed schedules. (TN CCSS Reading 3, 7, 9; TN CCSS Writing 2)
- 16) Compare and contrast different irrigation systems and summarize their advantages and disadvantages. Identify irrigation tools and system components and their function or application. Applying basic plumbing principles, calculate the water supply flow rate, head pressure requirements, and pipe and pump size considerations for a water garden, pool, or irrigation system. Identify and demonstrate the plumbing skills required to install irrigation and water features in a landscape or turf setting. (TN CCSS Reading 3; TN CCSS Math N-Q, A-CED, F-BF)
- 17) Design an irrigation system for a residential landscape and develop a bid presentation that identifies the project timeline, required permits, costs of installation and selected materials. (TN CCSS Writing 4; TN CCSS Math N-Q, G-MG)

## **Landscape Design**

- 18) Interpret topographical and soil maps to evaluate site suitability for selected landscape plants. Create a site analysis checklist to evaluate a proposed landscape site. (TN CCSS Writing 4; TN CCSS Math N-Q, G-MG)
- 19) Develop a list of tools and skills necessary for drafting landscape designs, including computer-assisted methods. Demonstrate the use of drafting tools and design equipment to create a basic landscape design. (TN CCSS Writing 6; TN CCSS Math G-MG)
- 20) Explore landscape design principles to outline the components of a comprehensive landscape design plan. Prepare comprehensive landscape plans using prospective residential and commercial plots and develop a landscape bid package and presentation for each plan. (TN CCSS Writing 7; TN CCSS Math G-MG)

## **Business Principles of Landscaping and Turf Management**

- 21) Compare and contrast different business models. Create a chart to illustrate the use, advantages, and disadvantages of each. Research successful landscaping and turf grass management businesses locally and use evidence from research to evaluate the skills and resources utilized for successful small business implementation. (TN CCSS Reading 7; TN CCSS Writing 4, 7, 8)



- 22) Using industry-specific terminology, explain the process for preparing a price estimate for landscape designs and packages. Create a price estimate and develop a presentation to secure a bid on a landscape project. (TN CCSS Reading 2, 4; TN CCSS Writing 4; TN CCSS Math N-Q)
- 23) Demonstrate the ability to interpret and read landscape drawings by measuring and calculating materials needed to execute the plan. Evaluate factors that affect profitability. (TN CCSS Reading 3; TN CCSS Math N-Q, G-MG, S-MD)

## Standards Alignment Notes

\*References to other standards include:

- TN CCSS Reading: [Tennessee Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects](#); Reading Standards for Literacy in Science and Technical Subjects 6-12; Grades 11-12 Students (page 62).
  - Note: While not directly aligned to one specific standard, students who are engaging in activities outlined above should be able to also demonstrate fluency in Standards 5, 6, 8, and 10 at the conclusion of the course.
- TN CCSS Writing: [Tennessee Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects](#); Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6-12; Grades 11-12 Students (pages 64-66).
  - Note: While not directly aligned to one specific standard, students who are engaging in activities outlined above should be able to also demonstrate fluency in Standards 3, 5, and 10 at the conclusion of the course.
- TN CCSS Math: [Tennessee Common Core State Standards for Mathematics](#); Math Standards for High School: Number and Quantity, Algebra, Functions, Geometry, Modeling, Statistics and Probability (pages 58-83).
  - Note: The standards in this course are not meant to teach mathematical concepts. However, the concepts referenced above may provide teachers with opportunities to collaborate with mathematics educators to design project based activities or collaborate on lesson planning. Students who are engaging in activities listed above should be able to demonstrate quantitative, algebraic, functional, geometric, and statistical reasoning as applied to specific technical concepts. In addition students will have the opportunity to practice the habits of mind as described in the eight Standards for Mathematical Practice.
- TN Biology II: Tennessee Science: [Biology II](#) standard 7 may provide additional insight and activities for educators.
- AFNR: [National Agriculture, Food and Natural Resources \(AFNR\) Career Cluster Content Standards](#): Students engaged in activities outlined above should be able to demonstrate fluency in Standards PS and CS at the conclusion of the course.
- P21: Partnership for 21st Century Skills [Framework for 21st Century Learning](#)
  - Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.

